SuperCap
Uninterruptible Power System

USER MANUAL
FOR MODELS:
1000VA and 3000VA

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SAVE THESE INSTRUCTIONS

Before You Start: Safety

Safety Symbols

DANGER!

Indicates there is a risk of electric shock. Extreme caution should be used.

CAUTION!

Indicates that the operator's manual should be referred to for additional information, such as operating and maintenance.

SAFE GROUND TERMINAL

Indicates primary safe ground.

LOAD ON/OFF

Indicates that the associated push-button turns the unit and its output receptacles on or off.

RJ-45 CONNECTOR

Indicates that the connector provides network interface connections and that telephone or telecommunications equipment should not be plugged into it.

DISPOSAL

Indicates that the UPS and its energy storage components should be disposed of in the correct manner.

NOTE / TIP:

Indicates additional information to assist the completion of a procedure or tips for ease of operation.

System Safety Checklist

The instructions contained within this safety manual are extremely important and should be closely followed at all times during installation and follow-up maintenance of the UPS and batteries or Energy Storage Unit.

1. This manual contains important instructions that should be followed during Installation and Maintenance of the UPS and Batteries or Energy Storage Unit.

2. The equipment can be operated by any individual. No previous experience is required.

DANGER!

3. **DANGER: (UPS with Internal Supercapacitors)**: Risk of electric shock - Hazardous live parts inside this unit may be energized from the Supercapacitor supply even when the input AC power is disconnected.

4. **DANGER: (No User Serviceable Parts)**: Risk of electric shock, do not remove cover. No user serviceable parts inside. Refer servicing to qualified service personnel.

5. **DANGER: (Non-isolated Supercapacitor Supply)**: Risk of electric shock, Supercapacitor circuit is not isolated from AC input; hazardous voltage may exist between battery terminals and ground. Test before touching.

CAUTION!

6. **CAUTION: (Fuses)**: To reduce the risk of fire, replace only with the same type and rating of fuse.

7. **CAUTION:** Intended for installation in a controlled environment. The maximum ambient temperature is 40°C.

DANGER!

8. **DANGER**: When replacing energy storage modules or components, replace with the same type and number.

9. **DANGER:** Do not dispose of Supercapacitors in a fire, as they may explode.

10. **DANGER:** Do not open or damage the Supercapacitors, chemicals may be released which is harmful to the skin and eyes.

11. **DANGER:** A battery or Supercapacitor unit can present a risk of electric shock and high short circuit current.

12. The following precautions should be taken when working with Supercapacitors:
    a. Remove watches, rings and other jewelry or metal objects.
    b. Use only tools with insulated handles.
    c. Wear rubber gloves and boots.
    d. Do not lay tools or metal parts on top of unit.
    e. Disconnect charging source prior to connecting or disconnecting Supercap terminals.

13. To reduce the risk of electric shock, disconnect the UPS from the AC input power supply before installing a communication interface cable. Reconnect the power cord only after communication interconnections have been made.

14. **DANGER:** To reduce risk of fire, use only No. 26 AWG or larger telecom line cord.

15. **DANGER: (For 700-3000VA 230V Models Only)**: To reduce risk of fire, connect only to a circuit provided with 20 amperes maximum branch circuit over-current protection in accordance with the National Electric Code, ANSI/NFPA 70".

16. **DANGER: (For 3000VA 120V Models with I/P Terminal Block Only)**: To reduce risk of fire, connect only to a circuit provided with 30 amperes maximum branch circuit over-current protection in accordance with the National Electric Code, ANSI/NFPA 70".

17. **DANGER: (For 700-2000VA 120V Models with I/P Terminal Block Only)**: To reduce risk of fire, connect only to a circuit provided with 20 amperes maximum branch circuit overcurrent protection in accordance with the National Electric Code, ANSI/NFPA 70".
    The instructions contained within this safety manual are extremely important and should be closely followed at all times during installation and follow-up maintenance of the UPS and batteries or Energy Storage Unit.

CAUTION!

The unit contains dangerous voltage levels. If the UPS is on, but not connected to an AC power supply, the unit's outlets may still be energized with voltage due to the presence of an internal power source, i.e. the battery or Supercapacitor Energy Storage Unit.

The unit should be installed indoors in an area free of electrically-conductive contaminants. The unit should be installed in a temperature and humidity controlled environment in order to reduce the risk of electric shock.

Only the power cord that is supplied with the unit should be used to connect it to the AC power supply. The equipment should also be located as close as possible to the AC supply.

Servicing and maintenance should only be carried out by qualified service personnel.
Before carrying out fuse replacement or shipping the unit, first ensure that the unit is turned off completely and all cables are disconnected.

SAVE THE ORIGINAL SHIPPING BOX
When returning the SuperCap UPS for servicing, use the original shipping box with the supplied Styrofoam protectors. Manufacturer is not responsible for damage caused by improper packaging of returned systems.

READ THE OPERATOR'S MANUAL
Before installation, become familiar with the SuperCap UPS by reviewing the procedures and drawings in this manual. If you have any questions about safe installation, operation, or maintenance, contact Manufacturer customer service department.

Complete the following for records & future servicing:

Model No.: _____

Serial No.: _____

(Above items can be found on the nameplate label attached to the side of the unit)

Products Sales Order No._____

P/N: _____

Purchase Order No.:_____

Purchased from: _____

(Following details are for installation location)

Installation date: _____

Installed by: _____

City: _____

State/Province: _____

Zip/Postal Code: _____

Country: _____

Telephone #:_____

Fax #: _____

E-Mail:_____

Section 1: Glossary

AC	Alternating Current
ANSI	American National Standards Institute
AWG	American Wire Gage
BBS	Battery Backup System
E-BBS	External Battery Backup System Cabinet
DC	Direct Current
IEEE	Institute of Electrical and Electronics Engineers
EIA	Electronic Industries Association
ITE	Institute of Transportation Engineers
KVA	Kilovolt-Ampere
LED	Light Emitting Diode
LCD	Liquid Chrystal Display
NEMA	National Electrical Manufacturers Association
NC	Normally Close
NO	Normally Open
OD	Outside Diameter
PTR	Power Transfer Relay
UL	Underwriters Laboratories
TB	Terminal Block
THD	Total Harmonic Distortion
UV	Ultraviolent Light
VDC	Volts DC
VA	Voltage Ampere
VAC	Voltage Alternating Current

Section 2: Description of Your SuperCap UPS System

The UPS module is a true online double-conversion UPS.
This means that the module is designed with a rectifier directly driving an inverter, even when powered from normal AC current.
It will provide near-instantaneous protection from input power interruptions by means of one or more attached batteries or an associated 'energy storage unit'.
A multifunction LCD control panel indicates the status of the system and allows the user to make parameter adjustments.
Communication options include power-monitoring & system management software and SNMP capability.
The SuperCap UPS System consists of two parts:

1. UPS Module
2. Energy Storage Module

The Supercapacitor-based Energy Storage Module is an alternative to expensive and hazardous external batteries. The Energy Storage Module is designed *specifically* for applications requiring short-term backup to sensitive loads that either need to ride-through voltage sags and momentary power outages or simply bridge the startup of a generator.

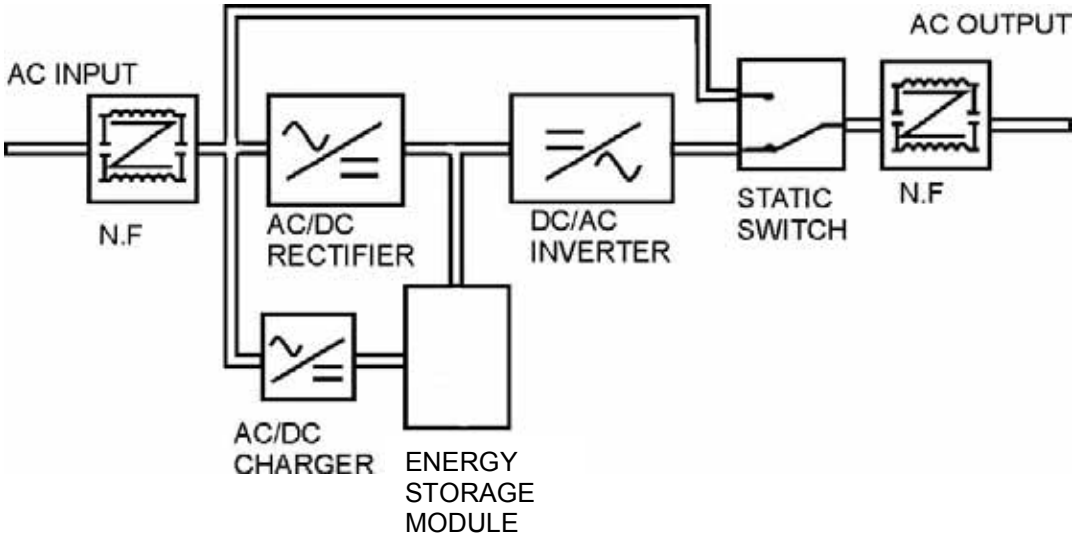
The Energy Storage Module can be charged independently of the UPS module. Unlike the charging times required by standard UPS batteries, the Energy Storage Unit can charge to near-full capacity in less than 5 minutes.

Key Features

1. Green, maintenance-free energy storage.
2. User-friendly, modular component system.
3. Lighter than other technologies.
4. Superior power density over batteries.
5. Virtually unlimited cycle life.
6. Multiple microprocessor and double-conversion design base.
7. High input power factor and DC-start function.
8. Protection against voltage sags and surges plus input frequency fluctuations.
9. Remote monitoring with an RS-232 interface and an optional network interface card.

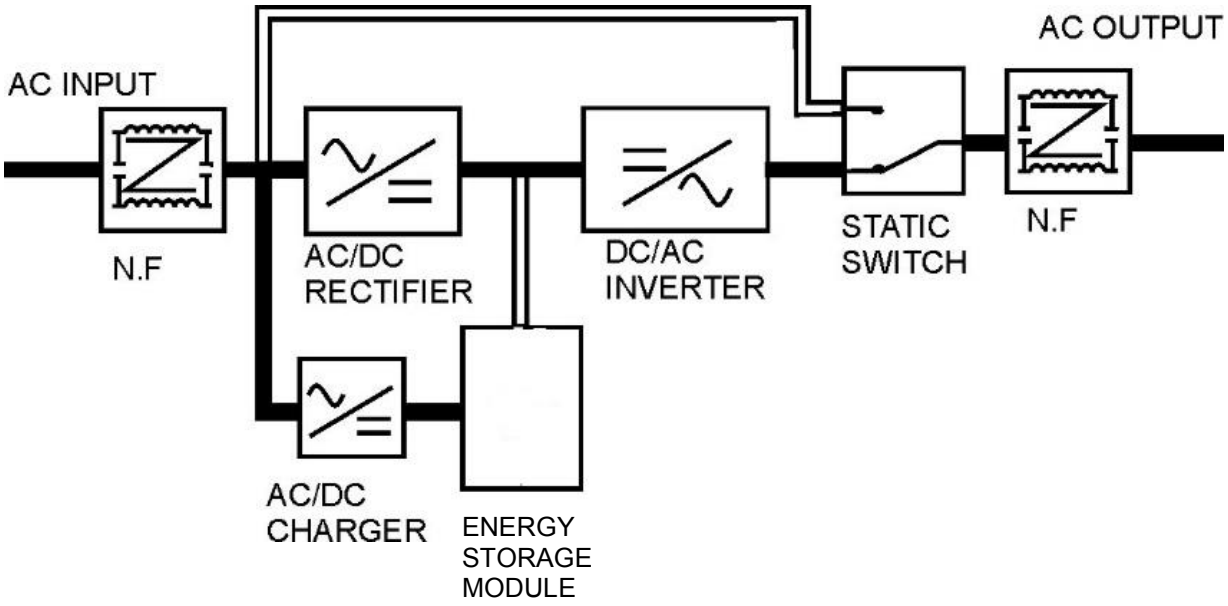
Operation Modes

1. UPS System Block Diagram:

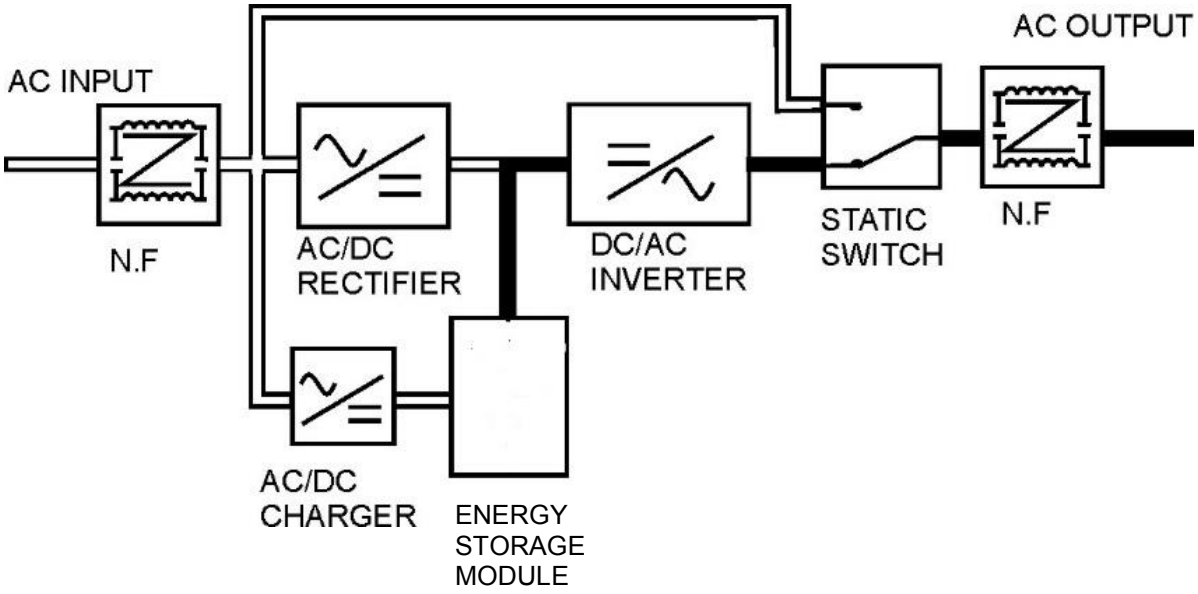


2. Normal Operation:

There are two main loops when AC utility is normal: the AC loop and the capacitor charging loop. The AC output power comes from AC utility input and passes through AC/DC rectifier, DC/AC inverter and static switch to support power to load. The capacitor charging voltage comes from AC utility input and converted by AC/DC charger to support capacitor-charging.



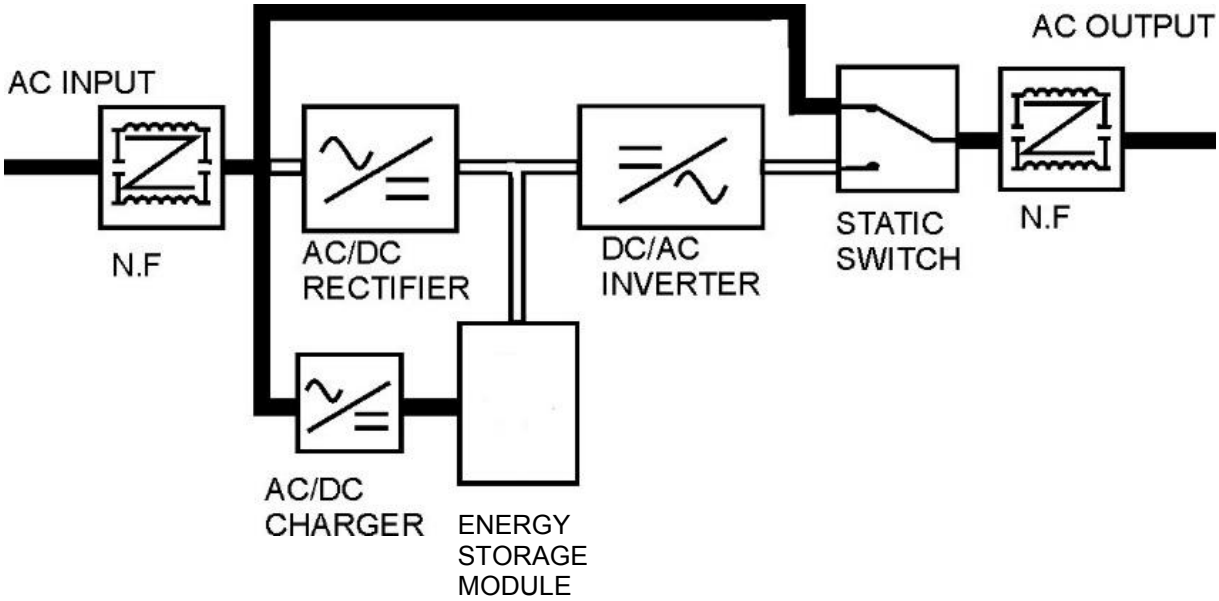
3. AC Utility Failure:



4. Bypass Enable:

Under the following conditions, the bypass will be enabled:

1. Overload.
2. Inverter failure.
3. Over-temperature.



Application Backup Time Considerations:

The backup time that a SuperCap system can supply a load depends on the useable energy stored in the Energy Module capacitors as well as the characteristics of the load being supported.

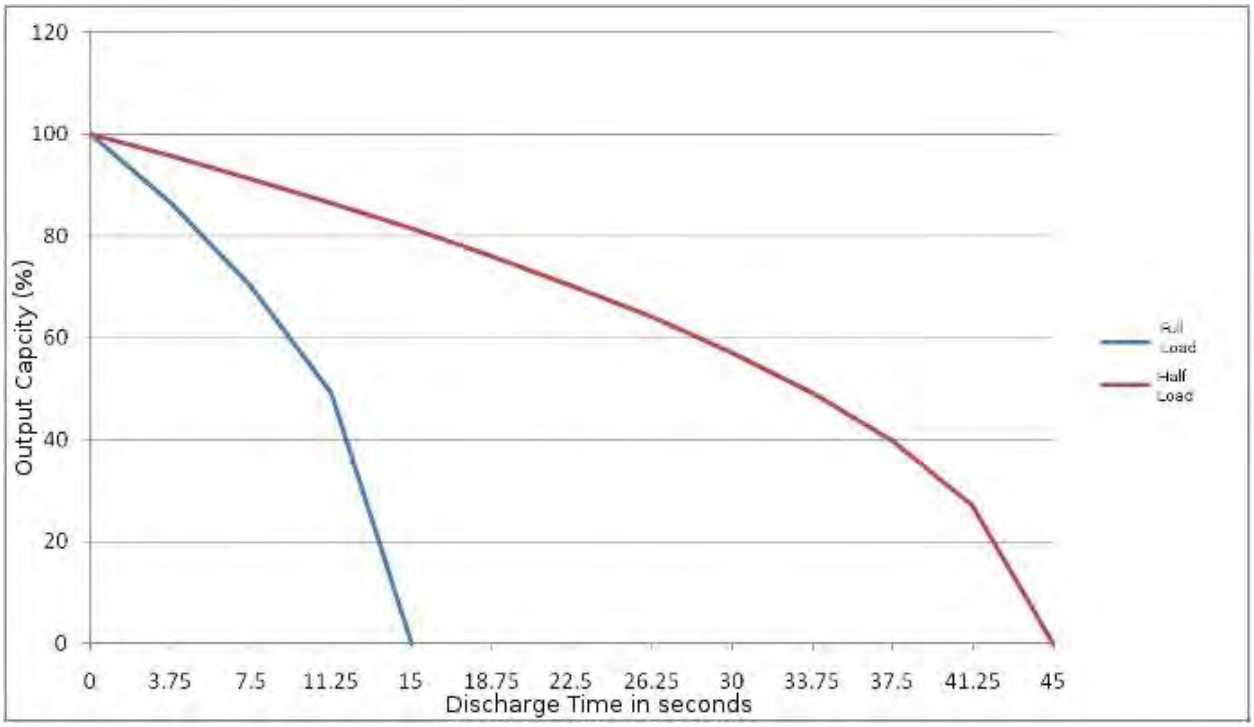
In order to determine if the available power produced by the SuperCap system will be adequate for a specific application, several characteristics of the load must be known or determined. These characteristics include:

- the RMS input voltage
- the load current in amps
- the power factor of the load (a number between 0 and 1)
- the backup time required in seconds

The input voltage, the load current and the power factor can all be measured fairly accurately by using an instrument such as the Fluke 43B Single Phase Power Quality Analyzer or equivalent.

As an example, a 3000VA, 2100 Watt model at either 120V or 230V provides an approximate backup time of 15 seconds at full load, and 45 seconds at half load.

The graph below illustrates the approximate capacities and times expected for these loads:



Section 3: Installation

DANGER!

The UPS module is available in both 120V and 230v models. Be sure to connect the UPS to the proper AC power source. Connecting the UPS to the wrong power source can cause damage to the UPS and potential injury to the operator.

The UPS module also requires an Energy Storage Module. Use caution when connecting the Energy Storage Module cable to the UPS Module. Do not allow the conductors on the DC connector to make contact with any metal object or with each other.

The SuperCap UPS System contains dangerous voltage levels!
Dangerous and potentially lethal charges can remain on the capacitors of the Energy Storage Unit even after it has been turned off and disconnected from the AC input line. Before moving, storing, carrying out capacitor bank replacement or shipping the system.

Ensure that the Energy Storage Module capacitors are *completely* discharged by putting the UPS module in backup mode.

1. **With the UPS Module ON (Normal Mode) and a load connected.**
2. **Remove AC Input.**
3. **Let it run in backup mode until it shuts off all cables are disconnected.**

CAUTION!

Prior to Start Up make sure the load is disconnected or in the "OFF" position, and verify that the input voltage meets the rating required by the UPS!

Transporting

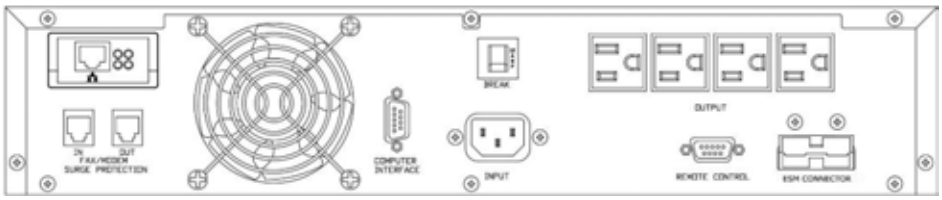
1. Disconnect all power cables if necessary.
2. Be careful not to damage the UPS while transporting.
3. Don't move the UPS upside down.
4. Please transport the UPS system only in the original packaging (to protect against shock and impact).

Positioning

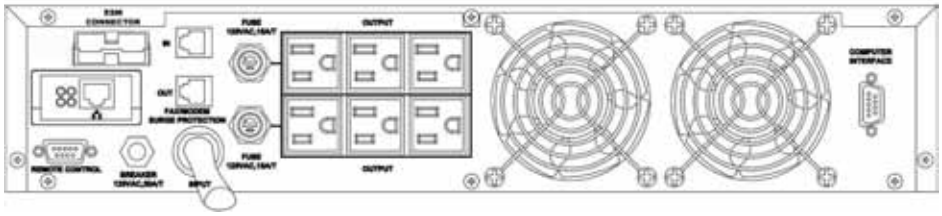
1. Do not put the UPS on rugged or declined surface.
2. Do not install the UPS system near water or in damp environments.
3. Do not install the UPS system where it would be exposed to direct sunlight or near heat.
4. Do not block off ventilation openings in the UPS system's housing and don't leave objects on the top of the UPS.
5. Allow a minimum distance of 10cm (3.9 inches) in the rear and two sides of the UPS for ventilation.
4. Keep the UPS far away from heat emitting sources.
6. Do not expose it to corrosive gas.
7. Ambient temperature: 0℃ - 40℃ (32°F – 104°F).

SuperCap UPS Rear Views

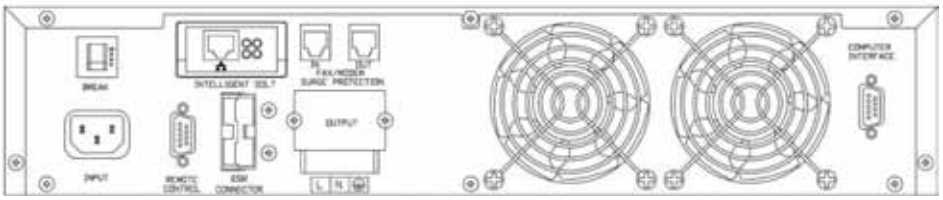
Electronics Module
1KVA RM-2U 120V NEMA



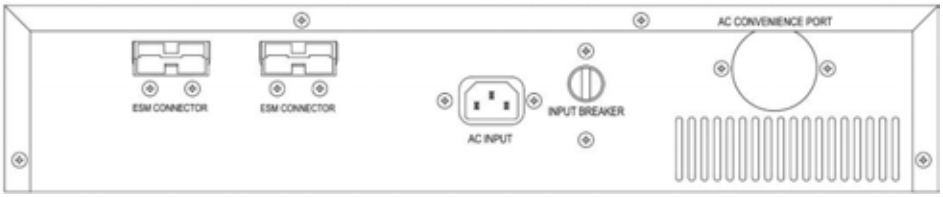
Electronics Module
3KVA RM-2U 120V NEMA



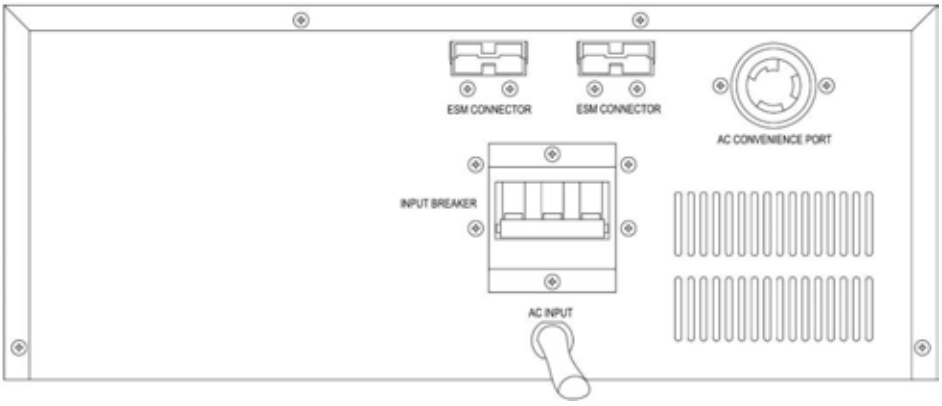
Electronics Module
3KVA RM-2U 230V HARDWIRE



SuperCap Module
1KVA RM-2U 120V IEC



SuperCap Module
3KVA RM-2U 120V NEMA



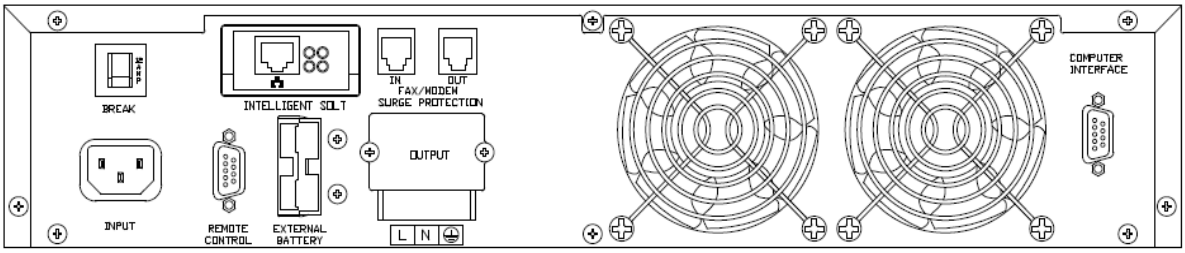
SuperCap UPS Connector Layout

The SuperCap UPS Module provides three connections on the rear panel:

1. An AC line cord (used for powering and charging the unit.)

2. A NEMA type-5 (120V unit) or NEMA type 6 (230V unit) connector (used for connecting a UPS to the AC output of the Energy Storage Module.)

3. An Anderson “Powerpole” type connector for connecting the DC-Out from the Energy Storage Unit to the DC-In connector on the UPS.



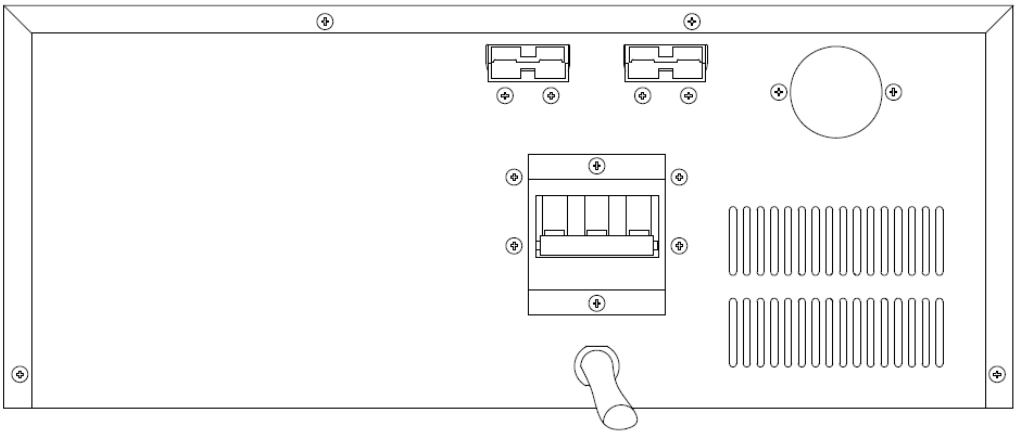
Energy Storage Unit Connector Layout

The Energy Storage Unit provides three connections on the rear panel:

1. An AC line cord (used for powering and charging the unit.)

2. A NEMA type-5 (120V unit) or NEMA type 6 (230V unit) connector (used for connecting a UPS to the courtesy AC output of the Energy Storage Module.

3. An Anderson “Powerpole” type connector for connecting the DC-Out from the Energy Storage Unit to the DC-In connector on the UPS.



Installation

The correct installation of the UPS module requires plugging the unit into a proper AV power outlet and also connecting the unit with an external Supercapacitor Energy Storage Module.

- Connect the UPS Module and Energy Storage Module only to a grounded AV Input Source.
- Place cables in such a way that no one can step on or trip over them.
- Do not disconnect the mains cable on the UPS system or the building wiring socket outlet during operations since this would cancel the protective grounding of the UPS system and of all connected loads.
- The UPS has its own internal power source (Supercapacitor). The output terminals may be live even when the UPS is not connected to the AC supply.
- Ensure that no fluids or other foreign objects can enter the UPS system.

CABLE CONNECTION

- The system should be installed and connected only by qualified electricians in accordance with applicable safety regulations.
- When installing the electrical wiring, please be aware of the nominal amperage of your incoming feeder.
- Please ensure that the incoming feeder is isolated and secured to prevent it from being switched back on again.

NOTE:

When installing the UPS Module and/or the Energy Storage Module in a rack. Please remove the rubber feet on the bottom of the respective pieces.

DANGER!

The SuperCap UPS System contains dangerous voltage levels!
Dangerous and potentially lethal charges can remain on the capacitors of the Energy Storage Unit even after it has been turned off and disconnected from the AC input line.
Before moving, storing, carrying out capacitor bank replacement or shipping the system.

Ensure that the Energy Storage Module capacitors are completely discharged by putting the UPS module in backup mode.

1. **With the UPS Module ON (Normal Mode) and a load connected.**
2. **Remove AC Input.**
3. **Allow it to run in backup mode until it shuts off all cables are disconnected.**

Step 1 - Connecting UPS Module to AC:

Option 1 – Connect the included power cord to an AC receptacle.
Option 2 – Connect the included power cord to the AC convenience port on the back of the Energy Storage Module.

NOTE:

IF the Electronics Module is plugged into the *AC* convenience outlet located on the back of the Supercapacitor Energy Storage Module make sure that the AC source to which the Storage Module connects can support the combined currents that will be drawn by *both* the Electronics Module and the Energy Storage Module. For example, at start-up the Energy Storage Module can draw up to 15A RMS. The AC source must be rated to supply this current in addition to the current required by the Electronics Module/UPS.

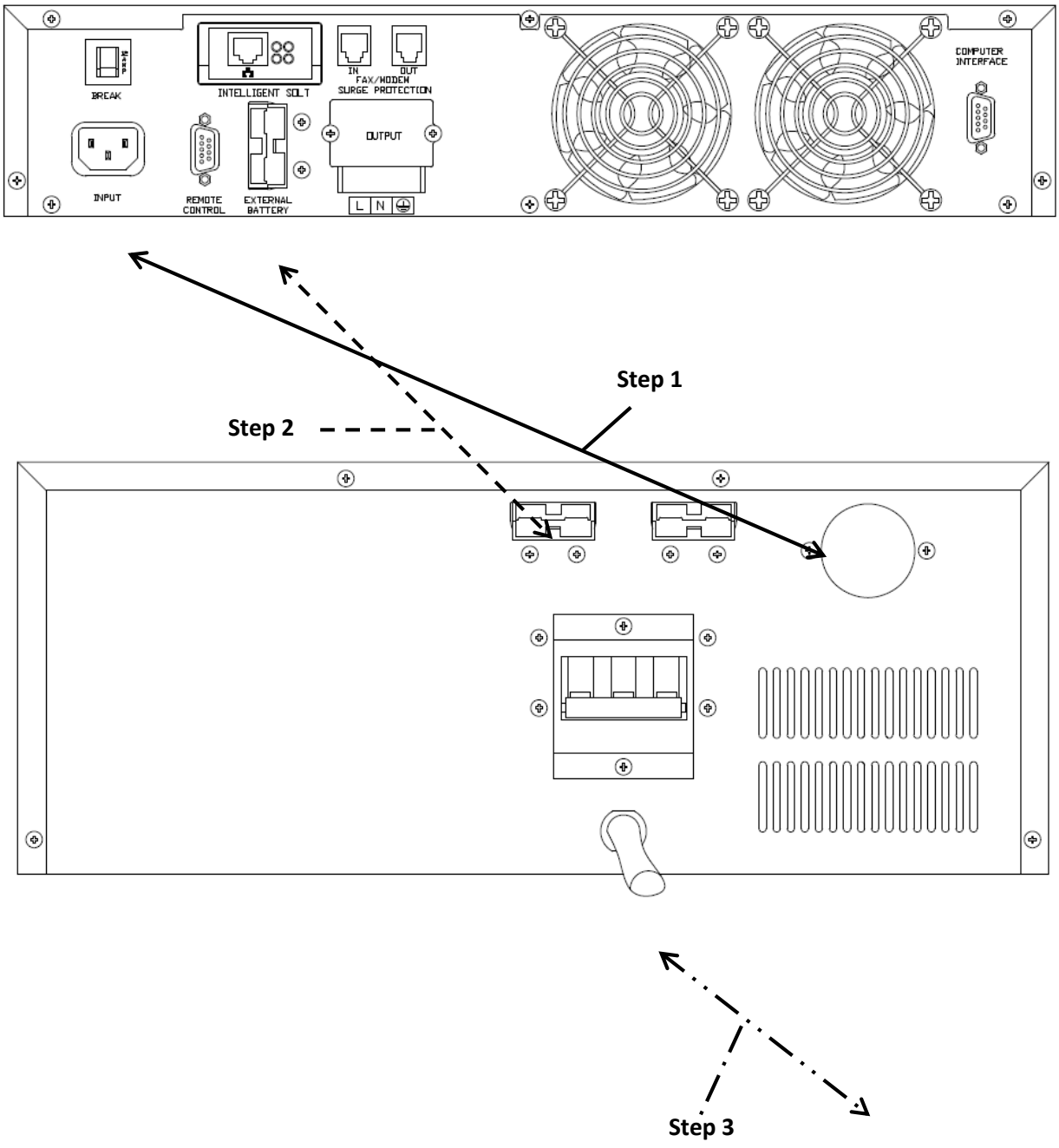
Step 2 - Connecting the SuperCap UPS to the Energy Storage Module:

The Energy Storage Module comes with a high-current DC output cord with a polarized connector on each end. Check the orientation of the connectors and the DC sockets on the rear panel of the UPS Module and the Energy Storage Module. Plug one end of the DC cord into the DC socket on the back of the Energy Storage Module and the other end into the DC socket on the back of the UPS Module.

Step 3 - Connecting the Energy Storage Module to AC:

The UPS also requires an Energy Storage Module. Use caution when connecting the DC input cable. **Do not allow the conductors on the DC connector to make contact with any metal object or with each other.**

Connect the attached power cord to an AC receptacle.



Section 4: Operation – LCD Interface

Front Panel Functions

The LCD display illuminates as soon as AC line power is applied to the unit and the MAIN MENU will be displayed.

Use the Up/Down buttons to scroll through the menu to view the available menu options.
Use the Enter key to select the option that is currently displayed.

Following is a list of functions/options available via the Main Menu of the LCD display:

- Rating Spec
- UPS Status
- Input and Output Voltages
- Input and Output Frequency
- Battery Voltage and Capacity
- Output Power
- Unit Temperature
- Event History
- Bypass Range Set
- Output Voltage & Frequency Adjust

The last two functions listed above, ‘Bypass Range Set’ and ‘Output Voltage & Frequency Adjust’ are UPS control functions, and are described in the following sections.

Operation

Check Prior to Start Up

1. Ensure the UPS is in a suitable position.
2. Check that the input cord is secured.
3. Make sure the load is disconnected or in the “OFF” position.
4. Check that the input voltage meets the UPS rating.

Operation Procedure

Please follow the instructions below for UPS operation.

1. Once the AC source is connected, the LCD Display will light up immediately to display the main menu greeting. The Normal LED will blink to indicate that the inverter is ready to be turned on.

2. By pressing the Enter-key and the Down-key simultaneously for 3 seconds, the UPS will start up after two beeps and the Normal LED illuminates to indicate power is coming from its inverter to the load.

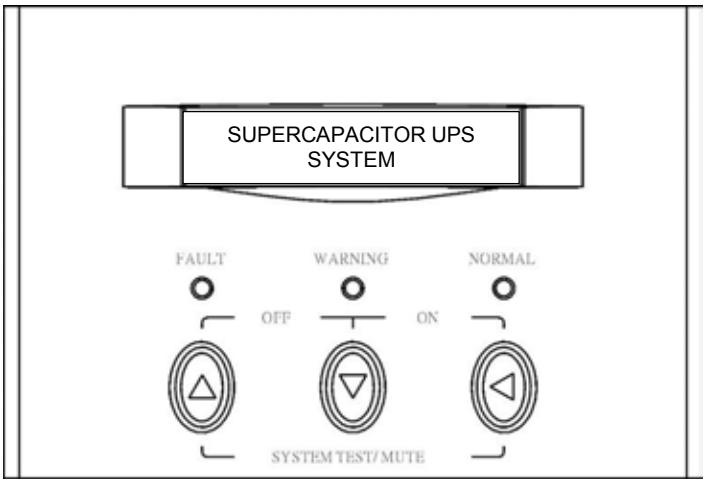
3. When the Down-key and the Up-key are pressed simultaneously for 3 seconds, the inverter will be turned off after two beeps and the UPS is in the standby status (LCD display illuminates and Normal LED is blinking) until the AC source is disconnected.

CAUTION!

Prior to Start Up make sure the load is disconnected or in the “OFF” position, and verify that the input voltage meets the rating required by the UPS!

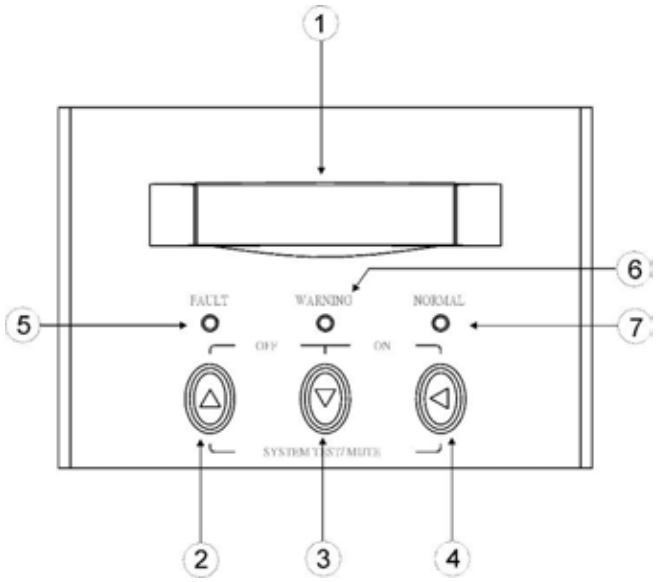
NOTE:

The LCD display illuminates as soon as AC line power is applied to the unit, and the MAIN MENU will be displayed.



The Front Panel

Fundamental operation of the Electronics Module is performed via the front panel. The panel includes an LCD display window, three LED status indicators and three push-button keys used for scrolling through the display menu and selecting menu options.



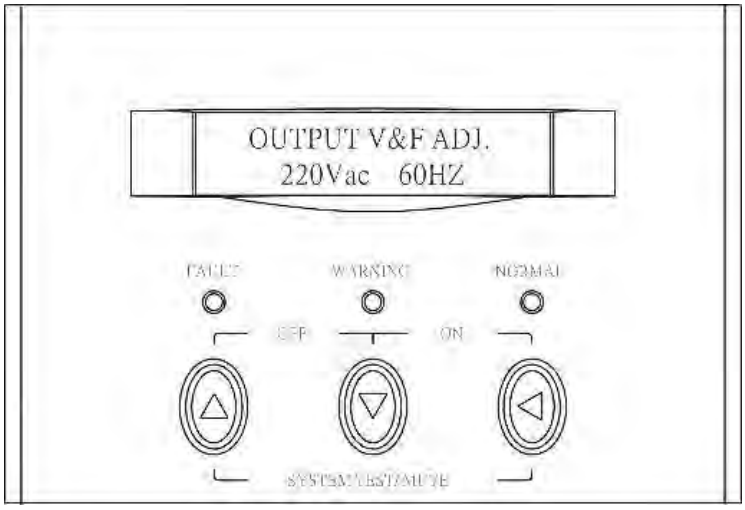
The buttons are also used in specific sequences to control the UPS as described below.

Turning the unit ON
Press the ***Enter-Key*** and the ***Down-key*** simultaneously for 3 seconds to turn on the UPS.

Turning the unit OFF
Press the ***Up-key*** and the ***Down-key*** simultaneously for 3 seconds to switch off the UPS.
Then, to shutdown the unit completely, disconnect the AC power to the unit.

Placing Unit in Bypass Mode
Press the ***Down-key*** and the ***Up-key*** simultaneously for 3 seconds. The inverter will be turned off after two beeps and the UPS is on standby (the LCD display illuminates and the 'Normal' LED is blinking).

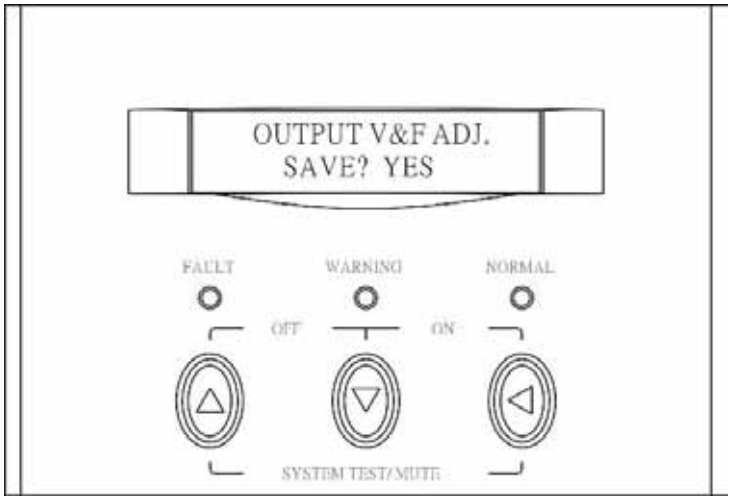
Adjusting Output Voltage & Frequency:



To adjust the output voltage and frequency follow the steps below:

1. Place the unit in Bypass Mode by pressing the ***Down-key*** and the ***Up-key*** simultaneously for 3 seconds. (The inverter will be turned off after two beeps and the UPS is on standby (the LCD display illuminates and the 'Normal' LED is blinking)).
2. From the Main Menu scroll to the *OUTPUT V&F ADJ.* option and press the ***Enter key***.
3. The cursor (→) will appear in the display.
4. Press the Enter key to select either the Voltage or Frequency setting to be adjusted.
5. Use the Up or Down key to scroll to the desired voltage or frequency value.
   NOTE: The selections available for Voltage are: 210V, 220V, 230V, or 240V.
   The selections available for Voltage are: 50Hz or 60Hz.
6. When the desired voltage or frequency value is displayed, press the ***Enter key*** to set that value as the output voltage or frequency.
7. Restart the UPS by pressing the ***Up-key*** and the ***Down-key*** simultaneously for 3 seconds to switch the UPS off; then, shutdown the unit completely by disconnecting the AC power to the unit. Reconnect the AC and turn the unit on by pressing the ***Enter-Key*** and the ***Down-key*** simultaneously for 3 seconds.

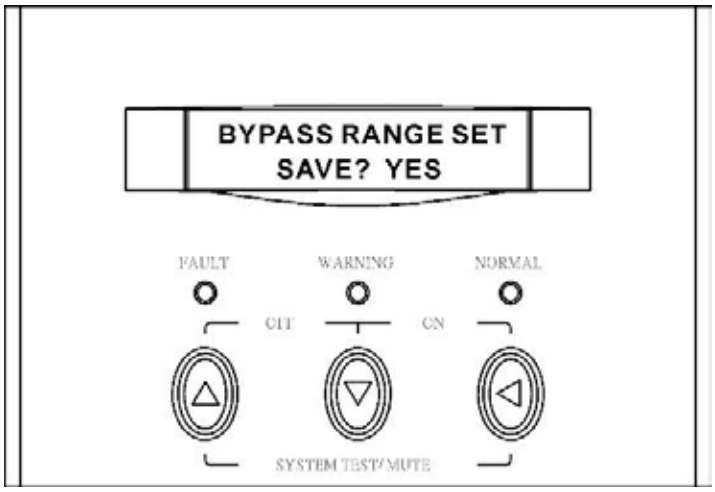
Adjusting the High and Low Voltage Limits:



To set the LO/HI voltage limits follow the steps below:

1. Place the unit in Bypass Mode by pressing the ***Down-key*** and the ***Up-key*** simultaneously for 3 seconds. (The inverter will be turned off after two beeps and the UPS is on standby (the LCD display illuminates and the 'Normal' LED is blinking)).
2. From the Main Menu scroll to the *BYPASS RANGE SET* option and press the Enter key.
3. The cursor (→) will appear in the display.
4. Press the Enter key to select either the LO or HI setting to be adjusted.
5. Use the Up or Down key to scroll to the voltage level desired for that limit.
   [**NOTE:** Pressing a key increases or decreases the voltage value in 1 volt increments.]
   a. The range of the LO limit is 176V +/- 20V. (156 to 196 volts).
   b. The range of the HI limit is 253V +/- 20V. (233 to 273 volts).
6. When the desired voltage value is displayed, press the Enter key to set that value.

Adjusting the Bypass Range:



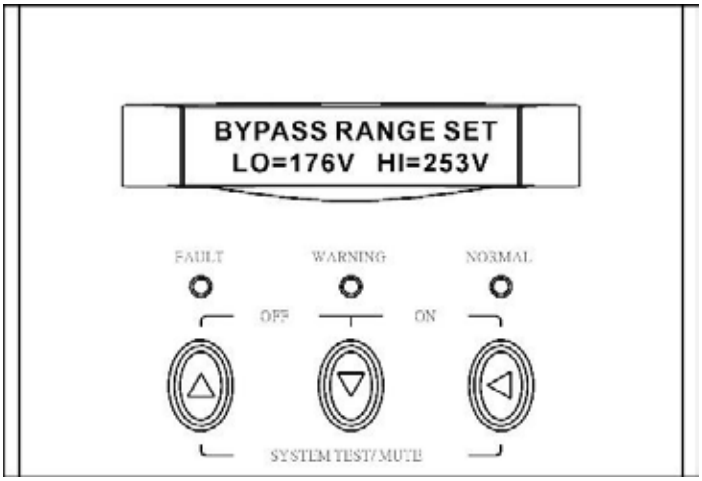
In 'Bypass' mode the UPS will feed the AC input line power directly to the load, bypassing all of the regulating/backup circuitry.

CAUTION!

To protect the load, the bypass auto-transfer function is activated *only* when the AC main voltage being sensed is within the range defined by the LO (low) and HI (high) settings.

NOTE:

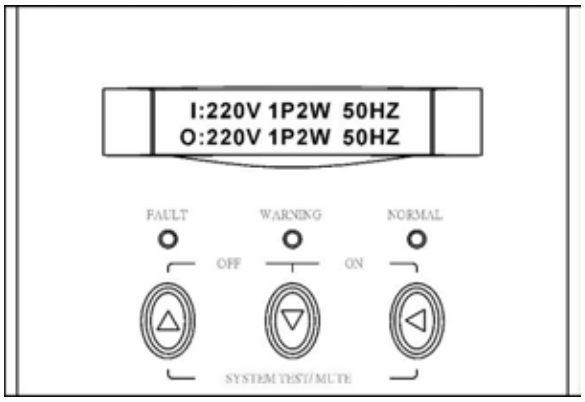
The BYPASS RANGE SET screen only appears in the menu when the unit is in Bypass mode.



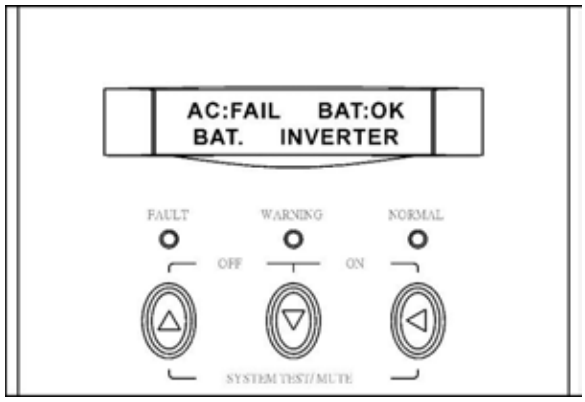
LCD Display Menu

Use Up/Down key to select menu-displays of the LCD described below. This screen will refresh once the system power is enabled.

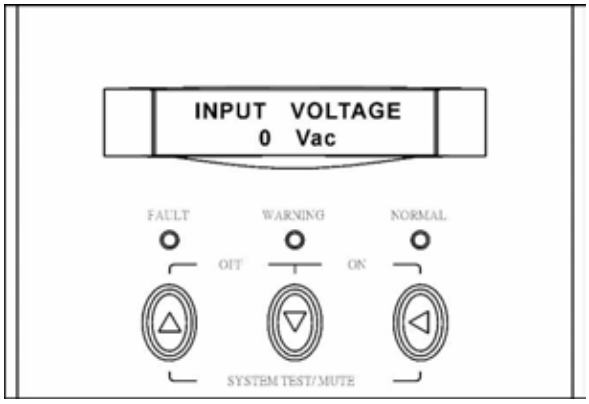
Rated Spec

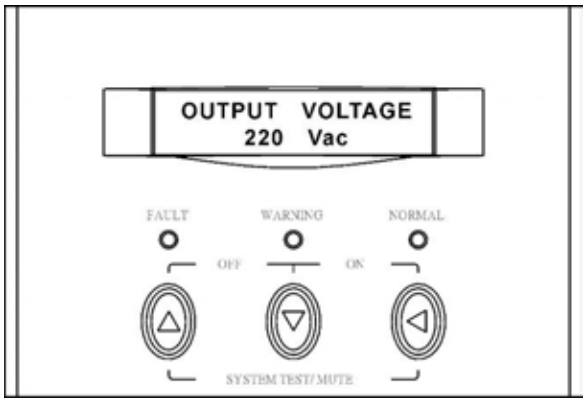


Status

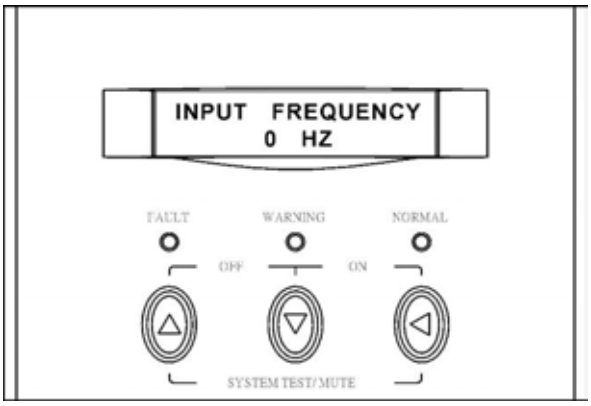


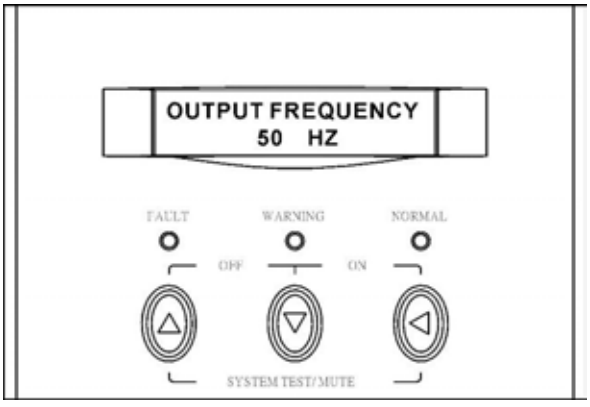
Voltage



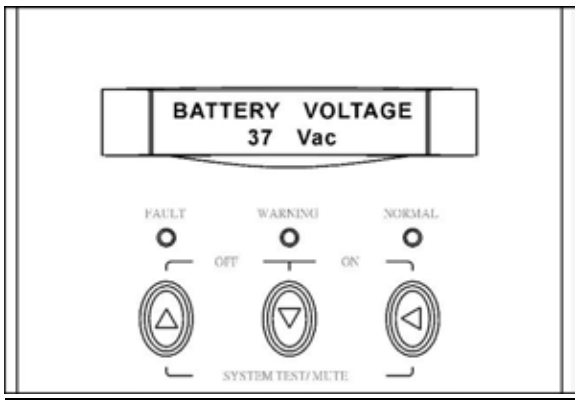


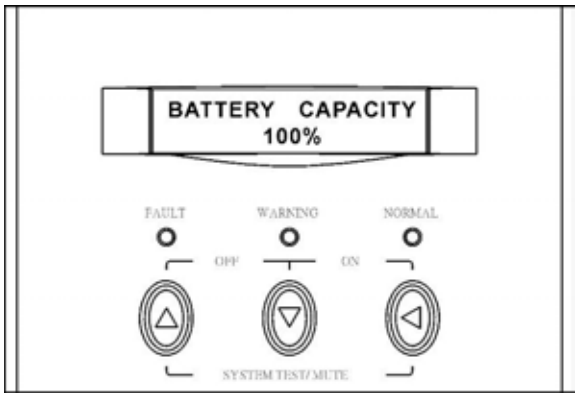
Frequency



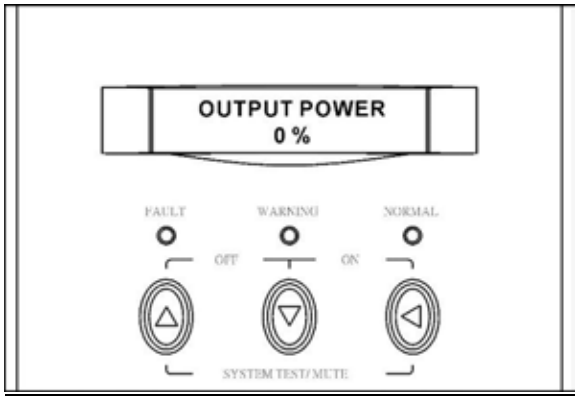


Battery Status

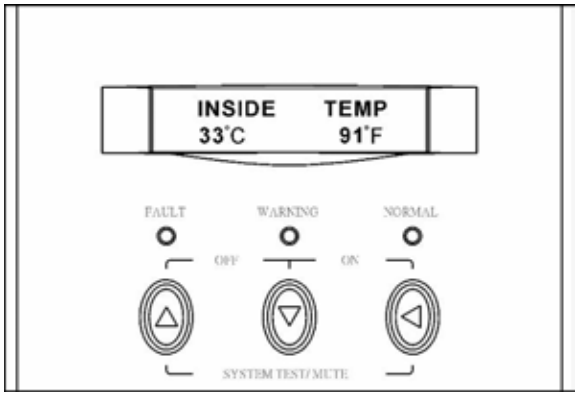




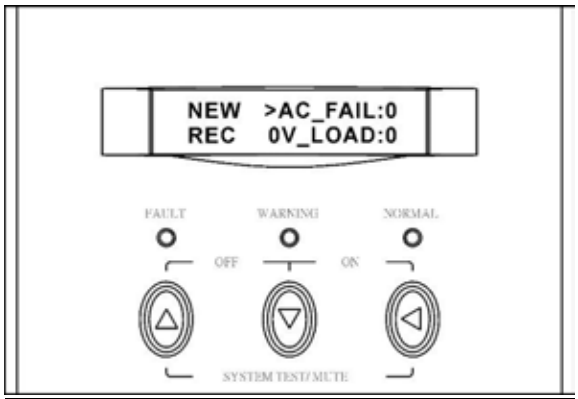
Output Power

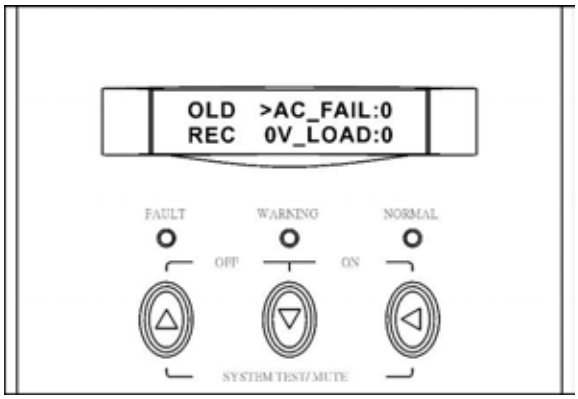


Temperature



History Record





Section 5: Operation – Web Interface

Network Interface Card

The network interface card provides comprehensive UPS management and flexible configuration via Web Browser, NMS, Telnet or SNMP. In addition, the network card provides:

- Support for advanced encryption: HTTPS, SSL, SSH, SNMPv3
- Centralized authentication by Radius
- Event notification via E-mail, SMS or Trap

UPS Module Web Interface Directory

	Menu	Sub-Menu
About	Help	About
Access Control	Configuration	SNMP
Auto Restart	Configuration	System Time
Battery Information	Information	Basic Information
Battery Status	Information	Current Status
Date Log	Log Information	Data Log
Date Schedule	Configuration	UPS ON/OFF Schedule
Device Connected	Configuration	SNMP
DNS Server IP	Configuration	Network
Dynamic DNS	Configuration	Network
Email Preferences	Configuration	Language
Email Setting	Configuration	Email
Ethernet	Configuration	Network
Event Log	Log Information	Event Log
Firmware	Help	Search NetAgent
Firmware Update	Help	About
Firmware Update Settings	Help	About
Hardware	Help	Search NetAgent
Help	Help	Help
Input Status	Information	Current Status
Interface Language	Configuration	Language
IP Address	Configuration	Network
IP Address	Help	Search NetAgent
MAC Address	Help	Search NetAgent
MIB System	Configuration	SNMP
Miscellaneous	Information	Remote Control
Network Status	Information	System Status
Output Status	Information	Current Status
PPPoE	Configuration	Network
Put UPS in Sleep mode	Information	Remote Control

	Menu	Sub-Menu
Reboot UPS	Information	Remote Control
Receiver cellular number(for Event Log)	Configuration	SMS
Recipient's Email Address (for Daily Report)	Configuration	Email
Recipient's Email Address (for Event Log)	Configuration	Email
S/N	Help	Search NetAgent
Save/Restore Settings	Help	About
Serial Port Information	Help	Serial Port Debug
Serial Received Information	Help	Serial Port Debug
Serial Sent Information	Help	Serial Port Debug
Single-Phase UPS Data Code Table	Information	Meter/Chart
Single-Phase UPS Data Graphics	Information	Meter/Chart
SMS Settings	Configuration	SMS
SNMP Inform Request	Configuration	SNMP
SNMP UDP Port	Configuration	SNMP
System Contact	Configuration	SNMP
System Information	Information	System Status
System Location	Configuration	SNMP
System Name	Configuration	SNMP
System Status	Information	Information
System Time	Configuration	System Time
Test UPS	Configuration	UPS Configuration
Trap Notification	Configuration	SNMP
Turn off UPS when AC power Fails	Information	Remote Control
UPS Action	Configuration	UPS ON/OFF Schedule
UPS Buzzer On/Off	Information	Remote Control
UPS Information	Information	Basic Information
UPS Properties	Configuration	UPS Configuration
UPS Recorded	Configuration	UPS Configuration
UPS Status	Information	Current Status
UPS Testing	Information	Remote Control
User Account	Configuration	Web/Telnet
Wake On LAN	Configuration	UPS ON/OFF Schedule
Wake up remote host	Configuration	UPS ON/OFF Schedule
Wake up UPS	Information	Remote Control
Warning Threshold Value	Configuration	UPS Configuration
Weekly Schedule	Configuration	UPS ON/OFF Schedule

Section 6: Communication

RS-232 Communication

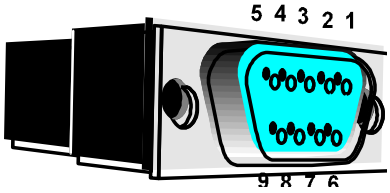
Serial Communication:
Power-monitoring & system management:
The UPS Module includes a communication interface (DB9 port) on the back that may be connected to a host computer. The port provides an RS-232 serial-link for monitoring software available from Marathon Power.
The UPS Module communicates with the computer by sending out RS-232 data streams to one of the serial ports. By this method the user is able to monitor the following parameters.

Input Voltage	Indicates the present input voltage to the UPS Module when AC power is present.
Output Voltage	Indicates the present output voltage of the UPS Module.
AC Frequency	Indicates the actual output frequency of the UPS Module.
Capacitor Voltage	Indicates the present DC voltage of the Energy Storage Module.
Temperature	Indicates the internal temperature inside of the UPS Module.

In addition to monitoring the UPS the software can also be used to control several functions on the UPS, including configuring and testing the UPS and its communications options.

DB9 PIN Assignment

The PIN 2: RS232 RXD, PIN 3: RS232 TXD, and PIN 5: GND. The other PINs have no function.



DB9 INTERFACE CONNECTOR

Step by Step Connecting With Windows XP

Before connecting to you SNMP card be sure you have <u>one</u> of the following.

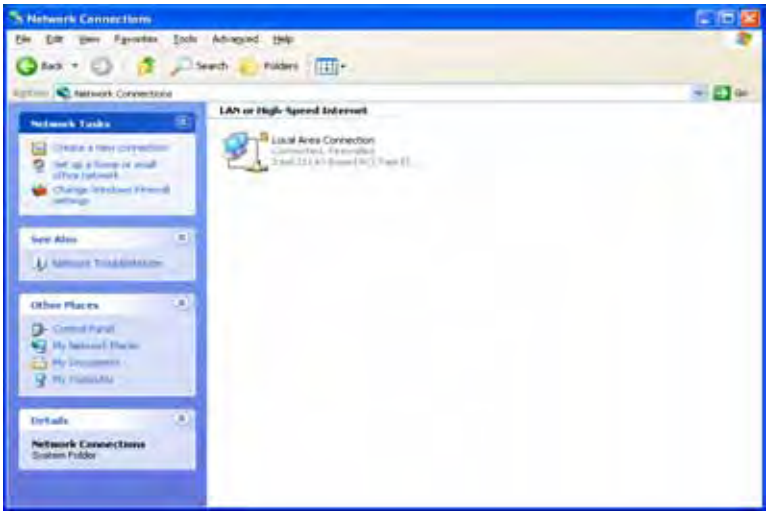
1. Ethernet crossover cable.
2. Or Switch or hub and two Ethernet straight through Ethernet cables.
3. Or Computer that has an AutoLink networking port.
   (An AutoLink port will determine if you are connecting to a device that requires a crossover cable or a straight through cable and automatically transmit and receive using the correct connection.)

ATTENTION!

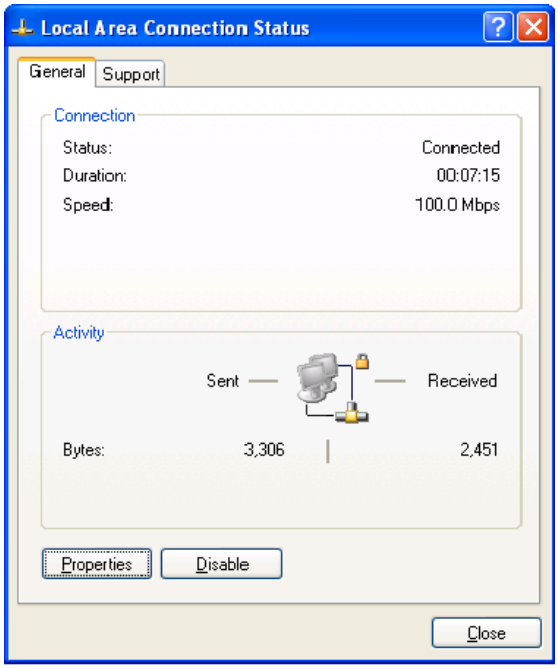
Record the settings that are already displayed before you change anything. Failure to return these setting back to "normal" could result in you not being able to connect to your usual network.

STEP 1: Go to the control Panel.

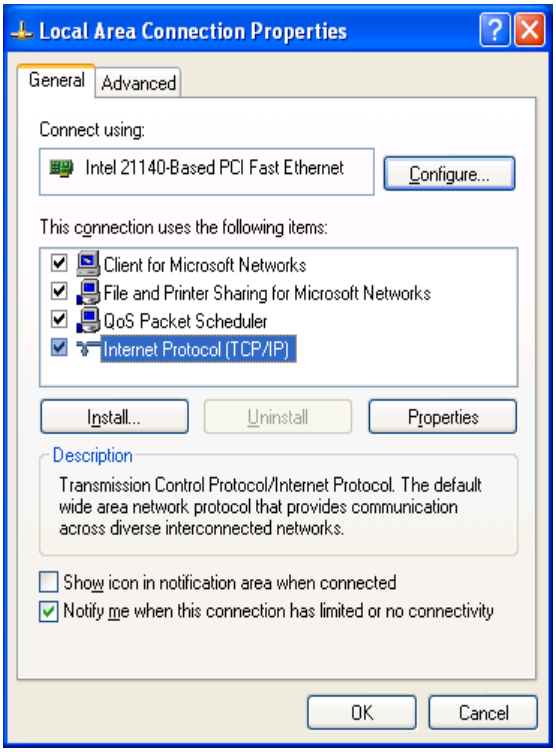
STEP 2: Double click on the Local Area Connection or Right click on the Local Area. Connection that you are using to connect to the NetPower Card, click Properties.



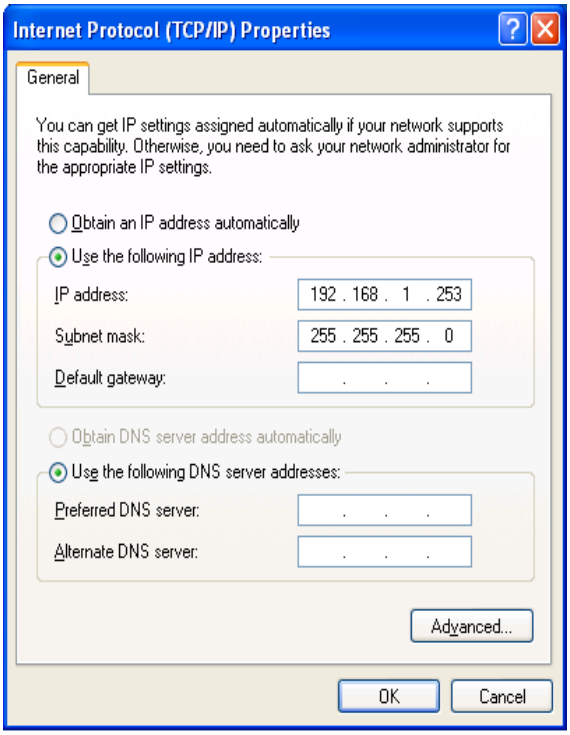
STEP 3: If you double clicked you will be presented with this screen, click on Properties.



STEP 4: After opening the properties dialog box, highlight Internet Protocol Version 4.



STEP 5: You will be presented with the dialog box below, enter the IP Address 192.168.1.253 with a subnet mask of 255.255.255.0, click Ok, Ok, then Close.


Internet Protocol (TCP/IP) Properties
General
You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.
Obtain an IP address automatically
Use the following IP address:
IP address:
192 . 168 . 1 . 253
Subnet mask:
255 . 255 . 255 . 0
Default gateway:
Obtain DNS server address automatically
Use the following DNS server addresses:
Preferred DNS server:
Alternate DNS server:
Advanced...
OK
Cancel

STEP 6: You should be back at Figure 1. Right click on Local Area Connection and click disable. Once it is disabled, right click and enable this connection.

STEP 7: Now open a web browser and enter 192.168.1.51 into the address bar. If you are prompted for a username and password enter.

Enter Username: **admin** Password: **user**

STEP 8: Click on the Regular Interface link, then go to the System Tab / Network and enter the appropriate information in the fields provided.

ATTENTION!

Depending on the information changed on the System Tab / Network, you could lose your connection to the network interface card.

Step by Step Connecting With Windows 7

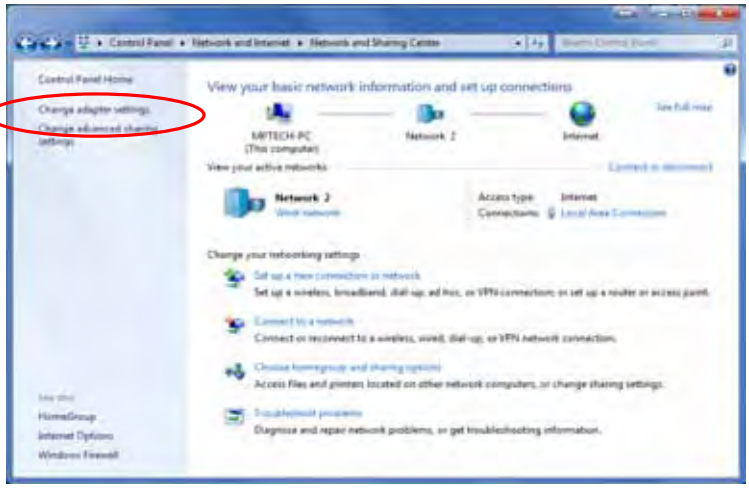
Before connecting to you SNMP card be sure you have <u>one</u> of the following.

1. Ethernet crossover cable
2. or Switch or hub and two Ethernet straight through Ethernet cables.
3. or Computer that has an AutoLink networking port.
   (An AutoLink port will determine if you are connecting to a device that requires a crossover cable or a straight through cable and automatically transmit and receive using the correct connection.)

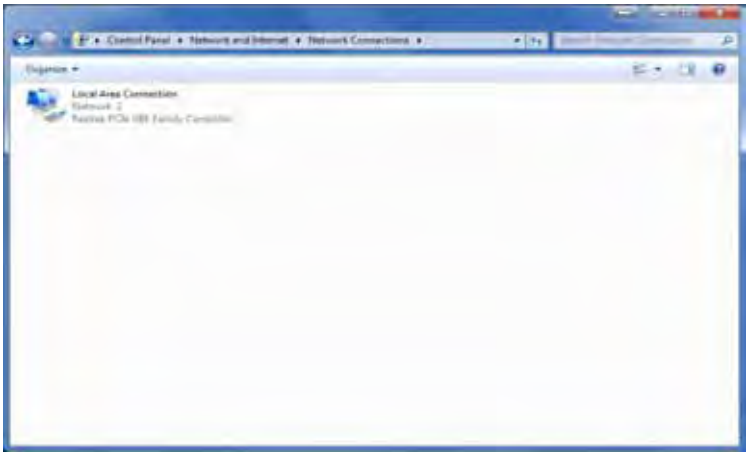
ATTENTION!

Record the settings that are already displayed before you change anything.
Failure to return these setting back to "normal" could result in you not being able to connect to your usual network.

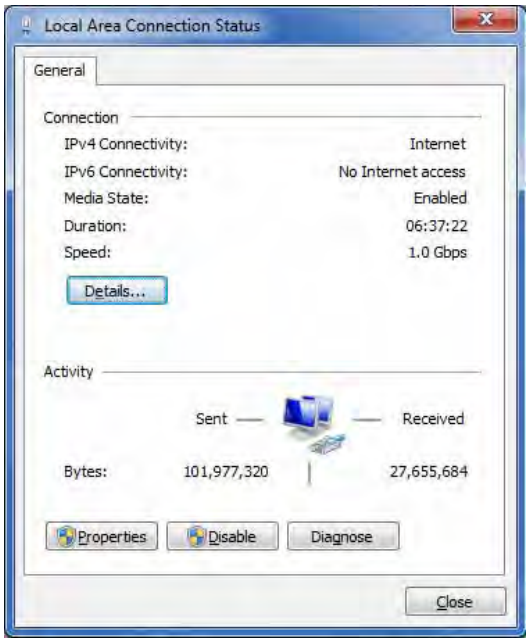
STEP 1: Go to the control Panel / Network and Internet / Network and Sharing Center.
Click on Change Adapter Settings.



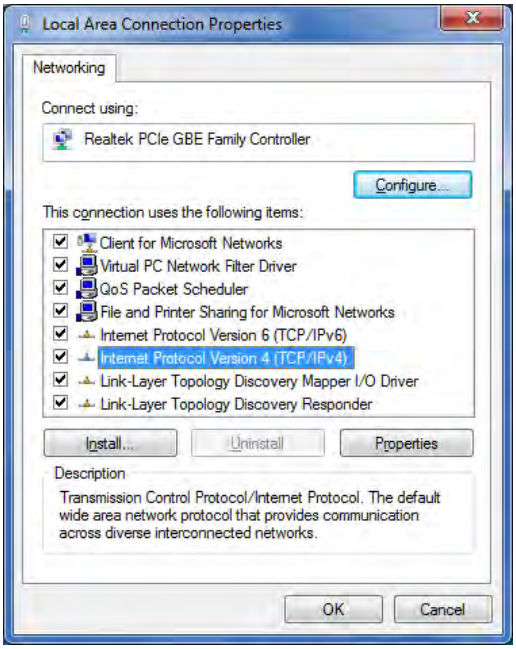
STEP 2: Double click on the Local Area Connection or Right click on the Local Area Connection that you are using to connect to the NetPower Card, click Properties.



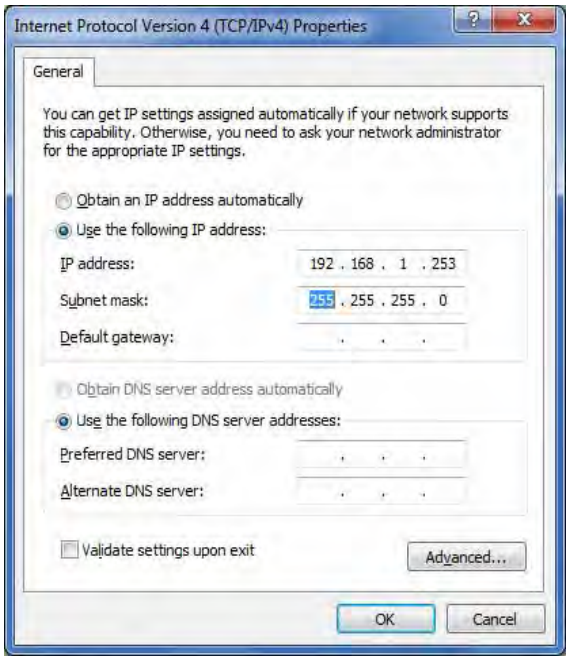
STEP 3: If you double clicked you will be presented with this screen, click on Properties.



STEP 4: After opening the properties dialog box, highlight Internet Protocol Version 4.



STEP 5: You will be presented with the dialog box below, enter the IP Address 192.168.1.253 with a subnet mask of 255.255.255.0, click Ok, Ok, Then Close.


Internet Protocol Version 4 (TCP/IPv4) Properties
General
You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.
Obtain an IP address automatically
Use the following IP address:
IP address:
192 . 168 . 1 . 253
Subnet mask:
255 . 255 . 255 . 0
Default gateway:
Obtain DNS server address automatically
Use the following DNS server addresses:
Preferred DNS server:
Alternate DNS server:
Validate settings upon exit
Advanced...
OK
Cancel

STEP 6: You should be back at Figure 1. Right click on Local Area Connection and click disable. Once it is disabled. Right click and enable this connection.

STEP 7: Now open a web browser and enter 192.168.1.51 into the address bar. If you are prompted for a username and password enter

Enter Username: **admin** Password: **user**

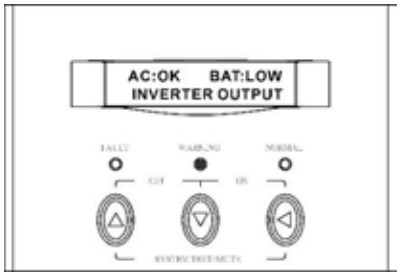
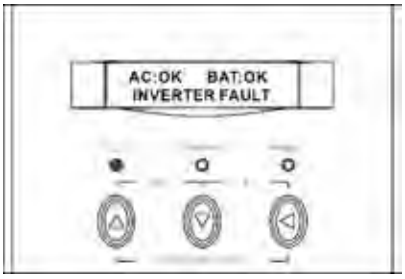
STEP 8: Using the Regular Interface and go to the System Tab / Network and enter the appropriate information in the fields provided.

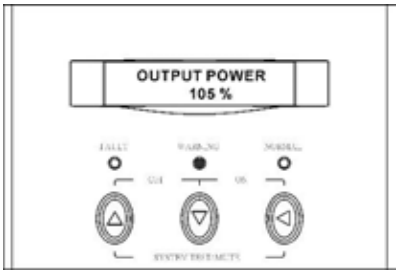
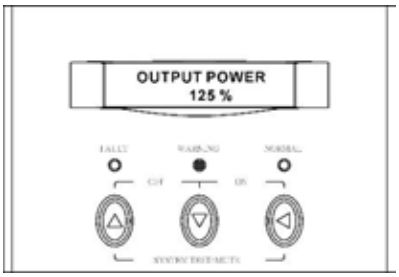
ATTENTION!

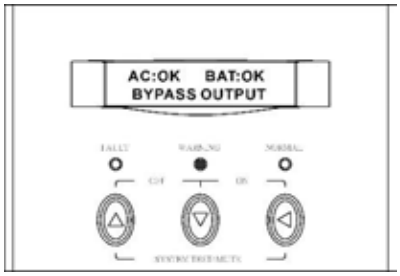
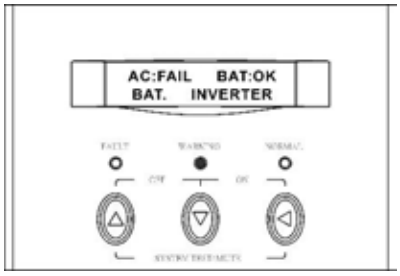
Depending on the information changed on the System Tab / Network, you could lose your connection to the NetPower Card and may have to reconnect.

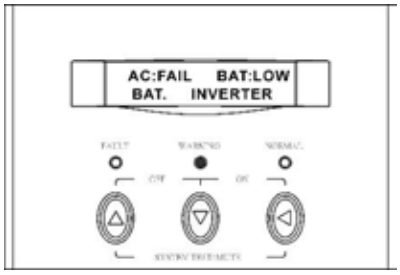
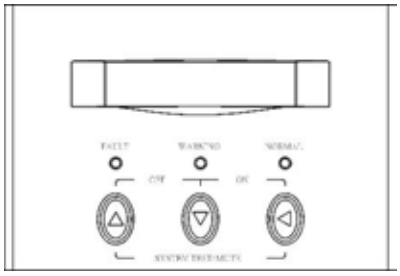
Section 7: Troubleshooting Guide

The following guideline may be helpful for basic problem solving.

No.	LED and LCD status	ACTION
1	 AC utility power is normal. UPS is running normally, but energy storage capacity is low (referring to Battery Status Menu). Buzzer beeps once every second for energy storage low.	Possible charger failure. Contact Marathon Power for service.
2	 AC utility power is normal. The output load is supplied through AC bypass. Fault LED lights up and buzzer beeps continuously.	Internal fault. Contact Marathon Power for service.

No.	LED and LCD status	ACTION
3	 AC utility power is normal but UPS is overloaded. Warning LED lights up and buzzer beeps every second.	Reduce the load to less than 100% of the rating of the unit.
4	 AC utility power is normal but UPS is overloaded up to 125%. Warning LED does not go out and buzzer beeps every 0.5 second.	Reduce the load to less than 100% of the rating of the unit.

No.	LED and LCD status	ACTION
5	 AC utility power is normal, but the load is supplied by AC utility power via bypass. Output power is more than 150% (referring to the Output Power Menu). Warning LED lights up and buzzer beeps continuously.	Reduce the load to less than 100% of the rating of the unit.
6	 AC utility power failure. The full load is supplied by the energy storage module. Buzzer alarm sounds every 4 seconds.	There is no problem with the unit, it is in backup mode. If it is not a power failure, check the rated input or connections.

No.	LED and LCD status	ACTION
7	 AC utility fails. The load is supplied by UPS in backup mode and energy storage is approaching low level. Buzzer alarm beeps every second.	The UPS will shut down automatically.
8	 AC utility power fails and energy storage is depleted. UPS has shut down automatically.	The UPS will restart when AC utility power is restored.

Section 8: Specifications

120V Versions

Rated Capacity and Power		1kVA / 700W	3kVA / 2100W
Input	Voltage and Tolerance	Single phase 120V, 80~160V at 70~100% load 70~160V at 50~70% load, 60~160V at 0~50% load	
	Frequency (Auto-sensing)	50Hz or 60Hz +/- 4Hz	
	Power Factor	0.97	
Output	Voltage and Frequency	Single phase 120V +/- 2%, 50Hz or 60Hz +/-0.5% (Battery mode)	
	Transient Response	+/- 3% (100% load variation)	
	Waveform and Distortion	Sine wave, THD < 3% at 0-100% linear load	
	Overload Capacity	125~150% 30secs, switch to bypass and auto re-transfer; >150% for 200ms	
	Crest Ratio	3 : 1	
Energy Storage	Capacity and Voltage	UltraCapacitor, 58F, 16V	
	Run-Time	15 seconds at full load, 40 seconds at half load	
	Recharge Time	Approx. 2 minutes (Input current dependent)	
	Life Cycle	Approximately 500,000 charge / discharge cycles	
Bypass	Automatic	Upon overload and UPS failure	
	Voltage Range	88V ~ 126V +/-10V (adjustable via LCD panel)	
Transfer Time	To and From Inverter	0 ms for AC fail; 2.5 ms typical to bypass	
Audible Alarms	Battery Mode	4 second (adjustable), 1 second beep when capacity low	
	Overload	Beep twice per second	
	Fault	Continuous beep tone	
Indicator	LCD	UPS status, I/P & O/P information, % Load, Event history	
Communication	Serial Port	RS-232 Interface; Optional power monitoring software	
	SNMP Intelligent Slot	Network card with SNMP Manager and Web browser	
Environment	Temperature	0-40 degrees C; 32-104 degrees F	
	Relative Humidity	0-95% non-condensing	
	Acoustic Noise (at 1M)	< 50 dBA	
Physical	Electronics Module Weight	23 lbs / 10.5 kgs	23 lbs / 10.5 kgs
	Energy Module Weight	34lbs. / 15.4 kgs	70 lbs / 32 kgs
	Electronics Module Dims	17” x 3.3” x 18.3" / 440 x 88 x 465 mm	17” x 3.3” x 18.3" / 440 x 88 x 465 mm
	Energy Module Dims	17” x 3.3” x 18.3" / 440 x 88 x 465 mm	17” x 6.6” x 18.3" / 440 x 176 x 465 mm

220V Versions

Rated Capacity and Power		1kVA / 700W	3kVA / 2100W
Input	Voltage and Tolerance	Single phase 220V, 160~300V at 70~100% load 140~300V at 50~70% load, 120~300V at 0~50% load	
	Frequency (Auto-sensing)	50Hz or 60Hz +/- 4Hz	
	Power Factor	0.97	
Output	Voltage and Frequency	Single phase 220V +/- 2%, 50Hz or 60Hz +/-0.5% (Battery mode)	
	Transient Response	+/- 3% (100% load variation)	
	Waveform and Distortion	Sine wave, THD < 3% at 0-100% linear load	
	Overload Capacity	125~150% 30secs, switch to bypass and auto re-transfer; >150% for 200ms	
	Crest Ratio	3 : 1	
Energy Storage	Capacity and Voltage	UltraCapacitor, 58F, 16V	
	Run-Time	15 seconds at full load, 40 seconds at half load	
	Recharge Time	Approx. 2 minutes (Input current dependent)	
	Life Cycle	Approximately 500,000 charge / discharge cycles	
Bypass	Automatic	Upon overload and UPS failure	
	Voltage Range	176V ~ 256V +/-20V (adjustable via LCD panel)	
Transfer Time	To and From Inverter	0 ms for AC fail; 2.5 ms typical to bypass	
Audible Alarms	Battery Mode	4 second (adjustable), 1 second beep when capacity low	
	Overload	Beep twice per second	
	Fault	Continuous beep tone	
Indicator	LCD	UPS status, I/P & O/P information, % Load, Event history	
Communication	Serial Port	RS-232 Interface; Optional power monitoring software	
	SNMP Intelligent Slot	Network card with SNMP Manager and Web browser	
Environment	Temperature	0-40 degrees C; 32-104 degrees F	
	Relative Humidity	0-95% non-condensing	
	Acoustic Noise (at 1M)	< 50 dBA	
Physical	Electronics Module Weight	23 lbs / 10.5 kgs	23 lbs / 10.5 kgs
	Energy Module Weight	34lbs. / 15.4 kgs	70 lbs / 32 kgs
	Electronics Module Dims	17” x 3.3” x 18.3" / 440 x 88 x 465 mm	17” x 3.3” x 18.3" / 440 x 88 x 465 mm
	Energy Module Dims	17” x 3.3” x 18.3" / 440 x 88 x 465 mm	17” x 6.6” x 18.3" / 440 x 176 x 465 mm

EMC Statements

FCC Part 15

NOTICE: Pursuant to section 15 of the FCC rules, this product has been tested and thereby complies with the conditions of a Class B (700-2000VA) and Class A (3000VA) digital device, which have been established for offering sufficient protection against dangerous interference for installation in a residential area. Installation and use of the equipment should comply with the instructions provided in order to avoid such interference due to the amount of radio frequency energy that is radiated and generated by the equipment. In spite of this, we cannot assure that a certain amount of interference may not occur in some installations. If, by turning on and off, it can be deduced that your radio or television reception is found to be influenced by harmful interference from the equipment, it is recommended that one of the following preventive measures be used:

1. Place the receiving antenna in a separate location or orientation.
2. Ensure a greater distance is achieved between the receiver and the equipment.
3. Ensure that your equipment is connected to an outlet on a separate circuit than the receiver.
4. Contact a technician experienced with radio and TV or call tech support for further assistance.

ICES-003
This Class B Interference Causing Equipment meets all requirements of the Canadian Interference Causing Equipment Regulations ICES–003. Cet appareil numérique de la classe B respecte toutes les exigences du Reglement sur le matériel brouilleur du Canada.

Declaration of Conformity Request
Units labeled with a CE mark comply with the following standards and directives:
1. Harmonic Standards: EN 50091-1-1, EN62040-1-1 and EN 50091-2, EN62040-2
2. EU Directives:
73/23/EEC, Council Directive on equipment designed for use within certain voltage limits.
93/68/EEC, Amending Directive 73/23/EEC
89/336/EEC, Council Directive relating to electromagnetic compatibility
92/31/EEC, Amending Directive 89/336/EEC relating to EMC
The EC Declaration of Conformity is available upon request for products with a CE mark.

Section 9: Service

CAUTION!

CAUTION (No User Serviceable Parts):
Risk of electric shock, do not remove cover. No user serviceable parts inside.
Refer servicing to qualified service personnel.

DANGER!

The SuperCap UPS System contains dangerous voltage levels!
Dangerous and potentially lethal charges can remain on the capacitors of the Energy Storage Unit even after it has been turned off and disconnected from the AC input line.
Before moving, storing, carrying out capacitor bank replacement or shipping the system.

Ensure that the Energy Storage Module capacitors are completely discharged by putting the UPS module in backup mode.

1. **With the UPS Module ON (Normal Mode) and a load connected.**
2. **Remove AC Input.**
3. **Allow it to run in backup mode until it shuts off.**

- Only persons familiar with Supercapacitors and with the required precautionary measures may exchange Supercapacitors and supervise operations. Unauthorized persons should not handle the system.

- Please take the precautionary measures specified below and any other measures necessary when working with the SuperCap UPS System.
    - remove wristwatches, rings and other metal objects.
    - use only tools with insulated grips and handles.

- Please contact Marathon Power for Supercapacitor replacement instructions.

Warranty

Limited Three-Year Warranty and Exclusions

NOTE: For this warranty to be valid, completed registration information must be received within 30 days of original purchase.

Marathon Power warrants to the original purchaser, who must have properly registered the product within 30 days of purchase, and not for the benefit of anyone else that this product at the time of its sale by Marathon Power is free of defects in materials and workmanship for three (3) years from the original purchase date. Marathon Power will correct such defects by repair or replacement, at its option, if within such three year period the product is returned prepaid and all warranty claim instructions are followed. This warranty excludes labor for removal or reinstallation of this product. This warranty is void if this product is installed improperly or in an improper environment, overloaded, misused, opened, abused, or altered in any manner, or is not used under normal operating conditions or not in accordance with all labels or instructions. There are no other or implied warranties of any kind, including merchantability and fitness for a particular purpose, but if any implied warranty is required by the applicable jurisdiction, the duration of any such implied warranty, including merchantability and fitness for a particular purpose, is limited to three years. Marathon Power is not liable for incidental, indirect, special or consequential damages, including damage to, or loss of use of, any equipment, lost sales or profits or delay or failure to perform this warranty obligation.

Limitations & Claims

This warranty does not cover any Marathon Power UPS or any properly connected electronic equipment which has been improperly installed, overloaded, abused or altered in any manner, or is not used under normal operating conditions, or in accordance with any labels or instructions, and does not cover any damage to properly connected electronic equipment resulting from a cause other than a “surge”.

Damage caused by failure to provide a suitable installation environment for the product (including, but not limited to, lack of a good ground) will not be covered by this warranty. This warranty does not apply to damage caused by direct lightning strikes, or damage caused by electrical disturbances that exceed published product specifications. These products are intended to limit the maximum amplitude of transient voltage surges on power lines to specified values. They are not intended to function as surge arrestors. The UPS is intended to be installed on the load side of the service entrance and has been tested to verify that transient voltage surges are limited when subject to non-repetitive transient voltage surge events. This warranty excludes any incidental, indirect, special or consequential damages, including without limitation, labor for removal or reinstallation of the Marathon Power UPS or any connected electronic equipment, data loss or alteration loss of equipment use, lost sales or profits and any such damages for delay or failure to perform this warranty obligation. This warranty is in lieu of and excludes all implied warranties of merchantability or fitness for use. In addition, the warranty does not cover restoration of lost data and reinstallation of software. Some states may not allow the exclusion or limitation of incidental or consequential damages or other remedies, so the above exclusions or limitations may not apply to you.

Take the following steps to file a warranty claim: Contact us at Marathon Power, Inc., Attn: Returns, 2538 E. 54th Street, Huntington Park, California 90255 or call (310) 689-2328 within 30 days of the occurrence. Be prepared to provide detailed information about the event, any damage, the UPS model number, purchase date and location. You will then be provided with a Return Authorization Number (RAN), and be instructed to forward your proof of purchase (receipt), an explanation of the event and your UPS. If Marathon Power determines that the damage was due to a “surge”, we may request that all connected equipment be submitted for evaluation. Marathon Power is not responsible for shipping costs. In the event that the equipment has been damaged by a “surge” Marathon Power will reimburse you for repair or replacement at fair market value (on a pro rata basis) as indicated by the respective amounts above. The warranty coverage is above and beyond, only to the extent needed, of that provided by any other source, including but not limited to any connected equipment coverage, any manufacturer’s warranty or insurance policy. To receive payment for repair to damage due to a “surge,” the original purchaser should (upon prior approval from Marathon Power) have such equipment repaired by an authorized service center of such equipment’s manufacturer. The original purchaser will submit a repair bill along with a statement from the repair facility documenting the nature of the damage and how it was sustained to said equipment.

Return Instructions

NOTE:

Manufacturer does not assume responsibility for damage caused by improper packaging of returned units. The SuperCap system should only be shipped in its original packaging carton of sufficient thickness to withstand handling.

Before returning a UPS or any system component for repair or replacement, a Return Material Authorization (RMA) number must be obtained from Customer service as shown below. Clearly write the RMA number on the original shipping container. If you do not have the original container, pack the unit with at least three inches of shock absorbing material, but do not use popcorn type material. Returns should be prepaid and insured (COD and freight collect cannot be accepted).

Contact Customer Service for service or technical information.

Marathon Power is available for customer service between 7:00am and 6:00pm PST, Monday-Friday and can be contacted as follows:

Phone: 310-689-2328
Fax: 310-689-2329
Email: support@marathon-power.com
Website: www.marathon-power.com
Address: 2538 E. 54th St., Huntington Park, CA 90255

Marathon Power, Inc. 2014

2538 E. 54th Street
Huntington Park, CA 90255
Office: 310-689-2328
Fax: 310-689-2329
support@marathon-power.com
www.marathon-power.com

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